

**ABSTRACT OF THE DISCLOSURE**

A system for detecting and graphically displaying a contents of a fast-moving target object comprises: a radiation source, having a position such that at least a portion of radiation emitted from the radiation source passes through the fast-moving target object, the fast-moving target object having a variable velocity and acceleration while maintaining a substantially constant distance from the radiation source and being selected from the group consisting of: a vehicle, a cargo container and a railroad car; a velocity measuring device configured to measure the variable velocity of the fast-moving target object; a detector array comprising a plurality of photon detectors, having a position such that at least some of the at least a portion of the radiation passing through the target object is received thereby, the detector array having a variable count time according to the variable velocity and a grid unit size; a counter circuit coupled to the detector array for discretely counting a number of photons entering individual photon detectors, the counter circuit measuring a count rate according to a contents within the fast-moving target object; a high baud-rate interface coupled to the counter circuit for sending count information from the counter circuit at a rate fast enough to support real-time data transfer therethrough; and a processor coupled to the velocity measuring device and to the high-baud-rate interface, receiving count information from the high baud-rate interface and generating distortion-free image data in real time as a function of the count information and the variable velocity. A method for using the system is also disclosed.